

Patent Claims Claims

1. (Currently Amended) Data registration device for data processing systems, particularly for the determination of multi-dimensional coordinates created by means of exertion of displacement and/or rotational forces, with comprising
 - a stand (1);
 - a retainer element (4) mounted in the stand (1) ~~so~~ such that ~~it~~ the retainer element may be displaced in at least two ~~or three~~ mutually perpendicular directions;
 - an operating ball (7) that may be rotated through three axes but not displaced within the retainer element (4);
 - at least one ~~sensors (8, 10, 16, 12)~~ to determine the displacement of the retainer element (4) and the rotation of the operating ball (7);
 - an interface unit that transmits ~~the~~ data delivered from the sensors ~~(8, 10, 16, 12)~~ to ~~the~~ a connected data processing system;

~~characterized in that~~ wherein the operating ball (7) is mounted within the retaining element (4) such that it may be grasped on two at least partially diametrically opposed sphere segment sections ~~with the thumb and forefinger of one hand~~, and ~~that both~~ wherein the displacement forces and the rotation forces with respect to all axes may be exerted by means of the operating ball (7).
2. (Currently Amended) Data registration device per Claim 1, ~~characterized in that~~ wherein the retainer element (4) may be simultaneously displaced in the direction of several displacement axes, and ~~that~~ wherein the operating ball (7) may be rotated simultaneously about several axes.
3. (Currently Amended) Data registration device per Claim 1 ~~or 2~~, ~~characterized in that~~ wherein the retainer element (4) possesses a frame-shaped ball mount (15) that surrounds the operating ball (7) along a great circle in a surrounded section greater than π .
4. (Currently Amended) Data registration device per Claim 1 ~~or 2~~, ~~characterized in that~~ wherein the retainer element (4) includes a key-shaped ball mount (22).

5. (Currently Amended) Data registration device per Claim 4, ~~characterized in that~~ wherein the operating ball (7) is mounted magnetically within the key-shaped ball mount (22), ~~wherein by~~ the operating ball (7) is hollow and is made of a non-magnetic material, ~~wherein by~~ a magnetizable retaining ball is mounted within the operating ball (7) so that it may move freely, and ~~wherein by~~ a magnetic field source positioned outside the operating ball (7) attracts the retaining ball into the key-shaped ball mount (22), and ~~wherein by~~ the operating ball (7) is mounted in the ball mount such so that it may rotate.
6. (Currently Amended) Data registration device per ~~one of Claims 3 through 5~~ Claim 3, ~~characterized in that~~ wherein the retainer element (4) includes the ball mount (15,22), an inner frame (5), and an outer frame (6), ~~wherein by~~ the ball mount (15,22) is mounted within the inner frame (5) which itself is mounted in the outer frame (6) such as to be displaceable along a first direction, which in turn is mounted in the stand (1) such as to be displaceable along a second direction perpendicular to the first direction, and ~~wherein by~~ at least one of the these components (15, 22; 5; 6) of the retainer element (4) is displaceable along a third direction that is perpendicular to the first and the second direction.
7. (Currently Amended) Data registration device per ~~one of Claims 1 through 6~~ Claim 1, ~~characterized in that~~ further comprising return elements (9, 11) ~~are included~~ that return the retainer element (4) or its components to a rest position when no displacement force is being exerted.
8. (Currently Amended) Data registration device per ~~one of Claims 1 through 7~~ Claim 1, ~~characterized in that~~ wherein displacement of the retainer element (4) is registered by path, force, ~~and/or~~ acceleration sensors.
9. (Currently Amended) Data registration device per ~~one of Claims 1 through 8~~ Claim 1, ~~characterized in that~~ further comprising at least two motion sensors (12) ~~are positioned~~ within the retainer element (4) that register the rotation of the operating ball (7) about three mutually-perpendicular axes.

10. (Currently Amended) Data registration device per Claim 9, ~~characterized in that~~ wherein the motion sensors (12) are optical sensors that sample ~~the~~ a surface of the operating ball (7) and its rotation.
11. (Currently Amended) Data registration device per ~~one of Claims 1 through 10~~ Claim 1, ~~characterized in that~~ further comprising additional actuators (26) ~~are included~~ that oppose or reinforce a varying force in reaction to control signals from the user resulting from displacement of the retainer element (4) ~~and/or~~ rotation of the operating ball (7).
12. (Currently Amended) Data registration device per ~~one of Claims 1 through 11~~ Claim 1, ~~characterized in that~~ further comprising additional switches ~~are included~~ that transmit additional control signals to the data processing system upon actuation.